REMARKS

Applicant has reviewed the Office Action mailed on May 5, 2006 as well as the art cited. Claims 1-7, 18, 21-27, 38, 41 and 44-47 are currently amended. No new matter has been added by these amendments. Claims 1-47 are pending in this application.

Summary of Examiner Interview

The Applicants' representative, Joseph Kendrick (Registration Number 53,109) thanks Examiner Ochoa for the opportunity to discuss aspects of this case in a telephone interview on July 24, 2006.

Claim 1 was specifically discussed with respect to the Examiner's rejection of the claim under 35 U.S.C. §103(a) as being unpatentable over Adibhatla et al. (U.S. Patent No. 6,466,858) in view of Smith et al. (U.S. Patent No. 5,606,505). During the interview, Applicants' representatives asserted that neither Adibhatla et al. nor Smith et al. discussed adding a second thrust measurement to the thrust-minus-drag filter that is not zero during cruise conditions. The Examiner and the Applicants' representatives discussed potential amendments to independent claims 1, 21 and 41 to clarify adding a second thrust measurement to the thrust-minus-drag filter that is not zero during cruise conditions. The Examiner agreed to further consider Applicant's arguments included in the next office action response.

Applicants believe that the substance and scope of the telephone interview of July 24, 2006 is accurately captured in the summary above and the arguments below.

Claim Objections

Claims 1-6, 18, 23-26, 38 and 44-47 were objected to because of informalities. The Examiner objected to claims 1-6, 23-26, and 44-47 because the first use of acronyms N1, N2, EPR, and/or PLA "should be defined to avoid any possible indefiniteness issues." Claims 18 and

38 were objected to because of "the miss conjugated term 'have.'" Applicant traverses these objections and requests reconsideration.

Applicant has amended claims 3-6, 23-26, and 44- 47 to define the acronyms N1, N2, EPR, and PLA. Applicant has amended claims 18 and 38 to replace the term "have" with "has". No new matter has been added by these amendments. Withdrawal of these objections is respectfully requested.

Rejections Under 35 U.S.C. § 103

Claims 1, 21 and 41-43

Claims 1, 21, and 41-43 were rejected under 35 USC § 103(a) as being unpatentable over Adibhatla et al. (U.S. Patent No. 6,466,858) in view of Smith et al. (U.S. Patent No. 5,606,505). Applicant traverses this rejection and requests reconsideration.

When applying 35 U.S.C. §103, the claimed invention must be considered as a whole; the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention and a reasonable expectation of success is the standard with which obviousness is determined. *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP 2143

Claims 1 and 21

With respect to the independent claims 1 and 21 the Applicant asserts that these independent claims are patentable over Adibhatla et al. (U.S. Patent No. 6,466,858) in view of Smith et al. (U.S. Patent No. 5,606,505) because the references, either alone or in combination, fail to teach or suggest the invention as claimed.

With regards to claim 1, applicant respectfully asserts that Adibhatla and Smith, either alone or in combination, fail to teach or suggest "computing a second thrust estimate from data measured from at least one engine sensor; and adding the second thrust estimate to the thrust-minus-drag mathematical model" as is provided by the amended claim 1 of the present application. Applicant's specification teaches that a "'Thrust – Drag' filter's performance is improved by adding a second thrust measurement to the filter that is not zero in cruise." Specification at par. [0022]. Further, "[a]dding such an engine thrust computation or engine model 25 to the parameter identification method provides a second thrust measurement to the 'Thrust – Drag' filter and improves the parameter estimation accuracy for a performance algorithm. Offline analysis using a least squares algorithm has shown that adding this measurement allows correct parameters identification in cruise." Specification at par. [0023].

In contrast, Smith teaches away from the present invention by teaching "[i]n order to take a measurement of the quantity thrust-minus-drag T-D, *an estimate of current acceleration must be available*. In a cruise condition of the aircraft, current acceleration is zero and a measurement is not taken unless this condition is ensured" Smith, col. 10 lines 29-33 (*emphasis added*). As further explained by the Applicant's specification, with the modeling method of Smith, "[i]n a cruise condition, current acceleration is zero and the thrust-minus-drag equation will, therefore, equal zero. As a result, it is difficult to identify model parameters in a cruise condition. In practice, this effect has been observed as parameter 'drift'. In other words, the parameters estimates will wander, or predictions will be off if the aircraft spends a long time in cruise." Specification at par. [0005]. The teachings of Adibhatla do not cure this defect of Smith. Neither Adibhatla or Smith, either alone or in combination, teach or suggest adding a second

thrust estimate to a thrust-minus-drag mathematical model, wherein the second thrust estimate is based on "engine performance data obtained from engine sensors" (see Specification par. [0022]) so that thrust-minus-drag measurements can be performed even when current acceleration is zero.

Adibhatla and Smith, either alone or in combination, fail to teach "computing a second thrust estimate from data measured from at least one engine sensor; and adding the second thrust estimate to the thrust-minus-drag mathematical model" as is provided by the amended claim 1 of the present application, and for at least this reason, claim 1 is allowable. Withdrawal of this rejection is respectfully requested.

With regards to claim 21, applicant respectfully asserts that Adibhatla and Smith, either alone or in combination, fail to teach or suggest "computing a second thrust estimate from data measured from at least one engine sensor; and adding the second thrust estimate to the thrust-minus-drag mathematical model" as is provided by the amended claim 21 of the present application. Applicant's specification teaches that a "'Thrust – Drag' filter's performance is improved by adding a second thrust measurement to the filter that is not zero in cruise." Specification at par. [0022]. Further, "[a]dding such an engine thrust computation or engine model 25 to the parameter identification method provides a second thrust measurement to the 'Thrust – Drag' filter and improves the parameter estimation accuracy for a performance algorithm. Offline analysis using a least squares algorithm has shown that adding this measurement allows correct parameters identification in cruise." Specification at par. [0023].

In contrast, Smith teaches away from the present invention by teaching "[i]n order to take a measurement of the quantity thrust-minus-drag T-D, *an estimate of current acceleration must be available*. In a cruise condition of the aircraft, current acceleration is zero and a measurement is not taken unless this condition is ensured" Smith, col. 10 lines 29-33 (*emphasis added*). As further explained by the Applicant's specification, with the modeling method of Smith, "[i]n a cruise condition, current acceleration is zero and the thrust-minus-drag equation will, therefore, equal zero. As a result, it is difficult to identify model parameters in a cruise condition. In

practice, this effect has been observed as parameter 'drift'. In other words, the parameters estimates will wander, or predictions will be off if the aircraft spends a long time in cruise." Specification at par. [0005]. The teachings of Adibhatla do not cure this defect of Smith. Neither Adibhatla or Smith, either alone or in combination, teach or suggest adding a second thrust estimate to a thrust-minus-drag mathematical model, wherein the second thrust estimate is based on "engine performance data obtained from engine sensors" (see Specification par. [0022]) so that thrust-minus-drag measurements can be performed even when current acceleration is zero.

Adibhatla and Smith, either alone or in combination, fail to teach "computing a second thrust estimate from data measured from at least one engine sensor; and adding the second thrust estimate to the thrust-minus-drag mathematical model" as is provided by the amended claim 21 of the present application, and for at least this reason, claim 21 is allowable. Withdrawal of this rejection is respectfully requested.

Claim 41

With regards to claim 41, applicant respectfully asserts that Adibhatla and Smith, either alone or in combination, fail to teach or suggest "a mathematical engine model in communication with the thrust-minus-drag filter, wherein the engine model receives engine performance data, and wherein the engine model provides a thrust estimate to the thrust-minus-drag filter based on engine performance data" as is provided by the amended claim 41 of the present application. Applicant's specification teaches that a "'Thrust – Drag' filter's performance is improved by adding a second thrust measurement to the filter that is non zero in cruise." Specification at par. [0022]. Further, "[m]any modern aircraft now have on-board estimates of engine thrust computed from engine performance data obtained from engines sensors…" Specification at par. [0022]. Also, "[a]dding such an engine thrust computation or engine model 25 to the parameter identification method provides a second thrust measurement to the 'Thrust-Drag' filter and improves the parameter estimation accuracy for a performance prediction algorithm. Offline

analysis using a least squares algorithm has shown that adding this measurement allows correct parameters identification in cruise." Specification at par. [0023].

In contrast, Smith teaches away from the present invention by teaching "[i]n order to take a measurement of the quantity thrust-minus-drag T-D, *an estimate of current acceleration must be available*. In a cruise condition of the aircraft, current acceleration is zero and a measurement is not taken unless this condition is ensured" Smith, col. 10 lines 29-33 (*emphasis added*). As further explained by the Applicant's specification, with the modeling method of Smith, "[i]n a cruise condition, current acceleration is zero and the thrust-minus-drag equation will, therefore, equal zero. As a result, it is difficult to identify model parameters in a cruise condition. In practice, this effect has been observed as parameter 'drift'. In other words, the parameters estimates will wander, or predictions will be off if the aircraft spends a long time in cruise." Specification at par. [0005]. The teachings of Adibhatla do not cure this defect of Smith. Neither Adibhatla or Smith, either alone or in combination, teach or suggest adding a second thrust estimate to a thrust-minus-drag mathematical model, wherein the second thrust estimate is based on "engine performance data obtained from engine sensors" (see Specification par. [0022]) so that thrust-minus-drag measurements can be performed even when current acceleration is zero.

Adibhatla and Smith, either alone or in combination, fail to teach "a mathematical engine model in communication with the thrust-minus-drag filter, wherein the engine model receives engine performance data, and wherein the engine model provides a thrust estimate to the thrust-minus-drag filter based on engine performance data" as is provided by the amended claim 41 of the present application, and for at least this reason, claim 41 is allowable. Withdrawal of this rejection is respectfully requested.

Claim 42 and 43 depend from and further define claim 41 and as a result are also allowable at least for the reasons identified above from claim 41.

Claims 2 and 22

Claims 2 and 22 were rejected under 35 USC § 103(a) as being unpatentable over Adibhatla et al. (U.S. Patent No. 6,466,858) in view of Smith et al. (U.S. Patent No. 5,606,505) as applied to claims 1 and 21 above, and further in view of Adibhatla et al. (U.S. Patent No. 6,502,085) (hereinafter, Adibhatla (2)). Applicant traverses this rejection and requests reconsideration.

Adibhatla(2) does not cure the previously mentioned defect in Smith. Adibhatla, Smith, and Adibhatla (2) either alone or in combination, fail to teach "computing a second thrust estimate from data measured from at least one engine sensor; and adding the second thrust estimate to the thrust-minus-drag mathematical model" as is provided by the amended claim 1 of the present application, and for at least this reason, claim 1 is allowable. Claim 2 depends from and further defines claim 1 and as a result is also allowable at least for the reasons identified above for claim 1. Withdrawal of this rejection is respectfully requested.

Adibhatla, Smith, and Adibhatla (2), either alone or in combination, fail to teach "computing a second thrust estimate from data measured from at least one engine sensor; and adding the second thrust estimate to the thrust-minus-drag mathematical model" as is provided by the amended claim 21 of the present application, and for at least this reason, claim 21 is allowable. Claim 22 depends from and further defines claim 21 and as a result is also allowable at least for the reasons identified above for claim 21. Withdrawal of this rejection is respectfully requested.

Claims 3-10, 23-30 and 44-47

Claims 3-10, 23-30 and 44-47 were rejected under 35 USC § 103(a) as being unpatentable over Adibhatla et al. (U.S. Patent No. 6,466,858) in view of Smith et al. (U.S. Patent No. 5,606,505) as applied to claims 1, 21 and 41 above and further in view of Bernier et al. (U.S. Patent No. 4,215,412). Applicant traverses this rejection and requests reconsideration.

Bernier does not cure the previously mentioned defect in Smith. Adibhatla, Smith, and Bernier either alone or in combination, fail to teach "computing a second thrust estimate from data measured from at least one engine sensor; and adding the second thrust estimate to the thrust-minus-drag mathematical model" as is provided by the amended claim 1 of the present application, and for at least this reason, claim 1 is allowable. Claims 3-10 depend from and further define claim 1 and as a result are also allowable at least for the reasons identified above for claim 1. Withdrawal of this rejection is respectfully requested.

Adibhatla, Smith, and Bernier, either alone or in combination, fail to teach "computing a second thrust estimate from data measured from at least one engine sensor; and adding the second thrust estimate to the thrust-minus-drag mathematical model" as is provided by the amended claim 21 of the present application, and for at least this reason, claim 21 is allowable. Claim 23-30 depend from and further define claim 21 and as a result are also allowable at least for the reasons identified above for claim 21. Withdrawal of this rejection is respectfully requested.

Adibhatla, Smith, and Bernier, either alone or in combination, fail to teach "a mathematical engine model in communication with the thrust-minus-drag filter, wherein the engine model receives engine performance data, and wherein the engine model provides a thrust estimate to the thrust-minus-drag filter based on engine performance data" as is provided by the amended claim 41 of the present application, and for at least this reason, claim 41 is allowable. Claim 44-47 depend from and further define claim 41 and as a result are also allowable at least for the reasons identified above for claim 41. Withdrawal of this rejection is respectfully requested.

Claims 11-20 and 31-40

Claims 11-20 and 31-40 were rejected under 35 USC § 103(a) as being unpatentable over Adibhatla et al. (U.S. Patent No. 6,466,858) in view of Smith et al. (U.S. Patent No. 5,606,505),

further in view of Bernier et al. (U.S. Patent No. 4,215,412) as applied to claims 1, 7, 21 and 27 above, and further in view of Chakravarty (U.S. Patent No. 5,457,634). Applicant traverses this rejection and requests reconsideration.

Bernier and Chakravarty do not cure the previously mentioned defect in Smith. Adibhatla, Smith, Bernier and Chakravarty either alone or in combination, fail to teach "computing a second thrust estimate from data measured from at least one engine sensor; and adding the second thrust estimate to the thrust-minus-drag mathematical model" as is provided by the amended claim 1 of the present application, and for at least this reason, claim 1 is allowable. Claims 11-20 depend from and further define claim 1 and as a result are also allowable at least for the reasons identified above for claim 1. Withdrawal of this rejection is respectfully requested.

Adibhatla, Smith, Bernier and Chakravarty, either alone or in combination, fail to teach "computing a second thrust estimate from data measured from at least one engine sensor; and adding the second thrust estimate to the thrust-minus-drag mathematical model" as is provided by the amended claim 21 of the present application, and for at least this reason, claim 21 is allowable. Claim 31-40 depend from and further define claim 21 and as a result are also allowable at least for the reasons identified above for claim 21. Withdrawal of this rejection is respectfully requested.

Because the Applicant believes claims 1-47 are allowable for the above reasons, Applicant may not have put forth responses to additional rejections to said claims at this time. However, the Applicant reserves the right to address said additional rejections to said claims if a further response is required.

CONCLUSION

Applicant respectfully submits that claims 1-47 are in condition for allowance and notification to that effect is earnestly requested. If necessary, please charge any additional fees or credit overpayments to Deposit Account No. 502432.

If the Examiner has any questions or concerns regarding this application, please contact the undersigned at 612-455-1687.

Respectfully submitted,

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